

CERTIFIED MAIL NO 91 7108 2133 3937 3827 8562



February 2, 2012

Mr. Paul Kalaiwaa
Solid & Hazardous Waste Branch, HDOH
919 Ala Moana Blvd., Room 212
Honolulu, HI 96813

Tesoro Hawaii Corporation
91-325 Komoehana Street
Kapolei, HI 96707
808 547 3111
808 547 3145 Fax

**RE: Post-Closure Groundwater Monitoring Annual Summary for 2011
Tesoro Hawaii Corporation Refinery (HID 056 786 395)**

Dear Mr. Kalaiwaa:

Enclosed is the **Annual Post-closure Groundwater Monitoring Summary** for the closed ponds at Tesoro Hawaii Corporation's refinery in Kapolei. The summary presents the key analytical results of the sampling events during 2011 for the post-closure monitoring wells.

Groundwater samples were collected from the 12 monitoring wells surrounding the closed ponds. On each of the four sides of the covered ponds, there are three wells drilled to different depths, 25, 43, and 60 feet below grade. Figure 1 – Location of Cluster Wells for Post-Closure Monitoring shows the approximate location of the four clusters of post-closure monitoring wells designated by the cluster well designation, CW1 – CW4. Figure 2 is a May 2005 satellite photograph of the old surface impoundments which were closed in 1994 and capped with asphalt. To date, the closed ponds, which include two concrete tank pads (intended for use in the future), have only been used to retain storm water. The left side of the photograph depicts the above-ground wastewater treatment plant which effectively replaced the closed surface impoundments.

All well sampling was conducted by personnel from URS Corporation. Both ASTM D 6771-02 – Standard Practice for Low-Flow Purging and Sampling for Wells and Devices for Ground-Water Quality Investigations (2/10/2002) and the purge method referenced in the RCRA Pond-Closure Monitoring Plan were used. The low-flow purge method verbally approved by the DOH shall be used for all future sampling events. Samples were analyzed by Test America in Aiea, Hawaii.

The first 2011 semi-annual sampling event was completed on March 3 2011 and the second 2011 semi-annual sampling event was completed on September 8, 2011. Samples were analyzed for volatile organic compounds, semi-volatile organic compounds, and RCRA metals.

Analytical results are summarized in Table 1 – March 2011 Semi-annual Post Closure Monitoring Results and Table 2 – September 2011 Semi-annual Post Closure Monitoring Results.

All analytical reports obtained from groundwater sampling conducted throughout the calendar year (including those not considered representative for metals) have been previously submitted to the DOH under separate letter.

Volatiles

Acetone, which had been detected, at concentrations greater than 20 ppb in three of the 12 wells in September of 2001, has not been detected again, since then.

MTBE, which had been present in the samples from well CW-2A at low levels from March 2000 through September 2002, has not been detected at a concentration of greater 5 ppb since then. The MTBE data for CW-2A are summarized below.

CW-2A		MTBE (ppb)
March	2000	8.9
September	2000	< 5.0
March	2001	9.3
September	2001	5.6
March	2002	6.0
September	2002	5.2
March 2003 - Sept 2011		<5.0

No other wells are or have indicated the presence of MTBE. There has been no MTBE, (used as octane enhancer) stored at the refinery since 1993.

Semi -Volatiles

All results for semi-volatiles in the March and September 2011 samples were not detected. Diethyl phthalate, detected in 2008, was not detected in 2009 - 2011. Pentachloro-phenol, detected in March 2008, was not detected in 2009 - 2011.

Metals

Antimony was detected in CW-3B at 419 ppb, once during the March 2005 sampling event. Antimony for all wells has remained below the reporting limit since 2005.

Barium has been detected in all of the CW since 2002 when lab reporting limit was lowered. CW-3A, B, & C continue to have distinct concentrations of barium above what is likely the background level of barium in the saline aquifer. In September 2011 the average of for the three CW3 wells was 133 ppb, compared to 60 ppb for all twelve wells, a magnitude similar to published seawater concentrations.

Chromium was first detected in CW-4C in September 2002 after the reporting limit was lowered to 5 ppb in March 2002. Since then, the presence of chromium in CW-4C has been regularly observed over time as indicated below.

Cluster Well 4C		Chromium, ppb
September	2002	6.2
March	2003	6.0
September	2003	6.9
March	2004	8.1
September	2004	30.8
March	2005	8.2
September	2005	34.0
March	2006	57 & 87 (duplicate)
August	2006	<5.0
September	2006	<5.0
March	2007	6.08
September	2007	6.1
March	2008	<5.0
September	2008	29.0
March	2009	9.74
September	2009	9.18
March	2010	<5.0
September	2010	46.0
March	2011	<10.0
September	2011	<25.0

Aside from 2006 for which there were a number of atypical metal results, chromium had not been detected in the other closure wells until 2007. In March 2007, 5 of the 12 monitoring wells had detectable chromium with an average concentration of 6.35 ppb. In September 2007, chromium was detected in 7 of the 12 wells with an average concentration of 8.55 ppb. In March 2008, no wells were found to have chromium. In retrospect the low (less than detection limit) results in March appear to be a bit of an anomaly. In September 2008, chromium was detected in 6 of 12 wells, with an average concentration of 12.5 ppb. The March 2009 samples indicated that 6 of the 12 wells contained chromium at an average concentration of 9.0 ppb. In September/November 2009, chromium in 5 of the 12 wells averaged concentration of 9.5 ppb. In March 2010 chromium was not detected in any well. In September 2010 it was only detected in cluster well 4C, but at 46.0 ppm. In 2011 it was below the reporting limits.

Nickel was first detected in 2002 with progressively lowering reporting limits. The detection of nickel is likely a function of improved analytical methods rather than changes in water quality. The reporting limit for nickel has declined over time yet the nickel concentration appears to be low and stable, as illustrated by the results for CW-3C summarized below.

Cluster Well-3C		Nickel (Reporting Limit) ppb	Nickel ppb
March	2001	180	BRL*
September	2001	100	BRL
March	2002	20	BRL
September	2002	5	9.8
March	2003	5	13.0
September	2003	5	12.9

March	2004	5	10.7
September	2004	5	10.6**
March	2005	5	8.8
September	2005	5	13.9
March	2006	20	BRL
August	2006	20	BRL
September	2006	5	6.1
March	2007	5	16.8
September	2007	5	11.9
March	2008	5	BRL
September	2008	5	6.59
March	2009	5	6.02
November	2009	5	17.8
March	2010	20	9.50
September	2010	20	BRL
March	2011	50	BRL
September	2011	20	BRL

* Below Reporting Limit (BRL)

** Average of primary and duplicate sample analysis during sampling event

In 2007, nickel was detected in CW-4C at 89 ppb in March, but was not detected during September. In 2008, nickel was detected in CW-4C at 6.59 ppb in September but was not detected in March. The March 2009 sample results at CW-4C indicated nickel at a concentration of 12.7 ppb; nickel was not detected during the September 2009 sampling. The March 2010 sample results at CW-4C indicated nickel below the reporting limit of 5 ppb and in September below the reporting limit of 20 ppb. The March 2011 sample results at CW-4C indicated nickel below the reporting limit of 50 ppb and in September below the reporting limit of 20 ppb.

Lead was first detected above the reporting limit (5 ppb) in March 2006 in well CW-4B. Lead was detected in March 2007 in wells CW-3C and CW-4C and in September 2007 in wells CW-2B and CW-3A. In 2008, lead was detected in CW-1A at 16.3 ppb but not in any of the other wells. The March 2009 samples showed one location contained lead just above the reporting limit, in CW-4B at 5.8 ppb.

The analytical results for samples collected on September 16, 2009 showed elevated levels of lead (between 28.8 ppb and 120 ppb). Accordingly, these results were considered not representative and CW-2A, CW-2B, CW-2C, CW-3A, CW-3B, and CW-3C were re-sampled and analyzed for the full list of RCRA metals. The re-sampling was performed on November 18, 2009, and the results indicated all wells had concentrations of lead below the reporting limit of 5 ppb. In 2010 and 2011 the lead concentrations were below the reporting limits in both sampling periods.

Mercury was first detected in March 2008 in all 12 wells as the reporting limiting for the analytical limit was lowered from 1.0 ppb to 0.025 ppb. The 40-fold increase in sensitivity to part-per-trillion levels revealed a mercury content which ranged from 0.13 to 0.47 ppb in March 2008. In March 2009, only CW-3A had a detectable concentration of mercury, at 0.060 ppb. In September/November 2009, three wells were shown to contain detectable concentrations of mercury, between 0.030 and 0.040 ppb. In March

of 2010 there were 6 wells which had detectable levels of mercury, the highest of which CW-2B had 0.09 ppb of mercury. There was no mercury detected above the 0.025 ppb reporting limit, during the second round of sampling in 2010 and also not in 2011.

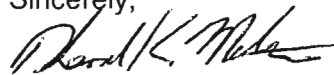
Vanadium is naturally occurring component of crude oil. Improvements in analytical procedures have lowered the threshold at which all of the metals can be detected and reported. Vanadium was detected for the first time in September 2008 and ranged between 10.2 and 15.0 ppb in four of the wells (10 ppb reporting limit). Vanadium was not detected in any of the closure wells during the March 2009 sampling. Vanadium was detected only in CW-3A at a concentration of 11.0 ppb during November 2009. In 2010 and 2011 vanadium levels were below reporting limits in all wells for both sampling periods.

Selenium was observed in March 2011 in all but one of the wells, averaging 71 ppb. Selenium was detected in only two wells (18 ppb average, 16 – 20 ppb range) during the subsequent and most recent testing in September of 2011. The only time selenium was detected previously was in March 2009 (24 ppb average) when it was detected in four wells. We will continue to monitor this to see if it is an anomaly.

In summary, the groundwater monitoring results collected since the closure of the ponds in 1995 continue to show no indication of any contamination that may have been caused by improper or incomplete closure of the ponds. With lowered reporting limits due to improvements in analytical methods, there are more reported detections above the reporting limits as time has progressed. Also, no damage to the cover of the closed pond area has been observed during the monitoring period. Small weathering cracking of the berm and cap continues to be inspected at least quarterly and repaired as needed.

Please contact Walt Albertson at 808-547-3945 if you have any questions concerning this report.

Sincerely,



Theodore K. Metrose
Manager, Refinery Environmental Affairs

Attachments

CC: Mr. Mitch Kaplan
US EPA Region IX (H-3-1)
75 Hawthorne Street
San Francisco, CA 94105-3901

Table 1 - March 2011 Semi-annual Post Closure Monitoring Results

Sample date: 3/03/11		Closure Well (CW) Sample Location ug/L											
COMPOUND	CW - 1a	CW - 1b	CW - 1c	CW - 2a	CW - 2b	CW - 2c	CW - 3a	CW - 3b	CW - 3c	CW - 4a	CW - 4b	CW - 4c ²	CW 4b Dupe (1) ²
Volatiles (8260B)	Test America - Hawaii Lab												
	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Semi-volatiles (8270C)	Test America - Hawaii Lab												
	<21	<21	<11	<11	<21	<11	<22	<11	<11	<21	<21	<11	<21
	<42	<41	<21	<21	<42	<21	<43	<21	<21	<43	<43	<21	<42
	<21	<21	<11	<11	<21	<11	<22	<11	<11	<21	<21	<11	<21
	<42	<41	<21	<21	<42	<21	<43	<21	<21	<43	<43	<21	<42
	<42	<41	<21	<21	<42	<21	<43	<21	<21	<43	<43	<21	<42
	<21	<21	<11	<11	<21	<11	<22	<11	<11	<21	<21	<11	<21
	<42	<41	<21	<21	<42	<21	<43	<21	<21	<43	<43	<21	<42
	Test America - Hawaii Lab												
Metals (6010B & 7470) ³	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	<50	<50	<50	<50	<50	<50	220	75	130	<50	<50	<50	<50
	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	76	59	61	54	87	90	<50	81	63	54	81	72	76
	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50

Notes: < # RL value is less than laboratory reporting limits (RL) for which the value is statistically qualified as valid.

Sampling was done using ASTM Micropurge Method.

- a wells were drilled to 25 ft below grade
- b wells were drilled to 43 ft below grade
- c wells were drilled to 60 ft below grade

Table 2 - September 2011 Semi-annual Post Closure Monitoring Results

Sample date: 9/08/11		Closure Well (CW) Sample Location ug/L												
COMPOUND		CW - 1a	CW - 1b	CW - 1c	CW - 2a	CW - 2b	CW - 2c	CW - 3a	CW - 3b	CW - 3c	CW - 4a	CW - 4b	CW - 4c ²	CW 4b Dupe (1) ²
Volatiles (8260B)		Test America - Hawaii Lab												
BENZENE		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
TOLUENE		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
XYLENES (TOTAL)		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
IODOMETHANE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
ACETONE		<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
MTBE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
CARBON DISULFIDE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
METHYLENE CHLORIDE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Semi-volatiles (8270C)		Test America - Hawaii Lab												
CHRYSENE		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
2,4-DIMETHYLPHENOL		<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19
NAPHTHALENE		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
3-NITROANILINE		<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19
4,6-DINITRO-2-METHYLPHENOL		<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19
DIETHYL PHTHALATE		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
4-NITROPHENOL		<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19
Metals (6010B & 7470)³		Test America - Hawaii Lab												
ANTIMONY		<10	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
ARSENIC		<10	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
BARIUM		29	44	38	36	46	33	180	80	140	34	28	28	29
BERYLLIUM		<4	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
CADMIUM (TOTAL)		<5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
CHROMIUM (TOTAL)		<5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
COBALT		<10	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
LEAD (TOTAL)		<5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
MERCURY (TOTAL) ¹		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
NICKEL (TOTAL)		<10	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
SELENIUM		<10	<20	<20	20	<20	<20	16	<20	<20	<20	<20	<20	<20
VANADIUM (TOTAL)		<10	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20

Notes: < # RL value is less than laboratory reporting limits (RL) for which the value is statistically qualified as valid.

Sampling was done using ASTM Micropurge Method.

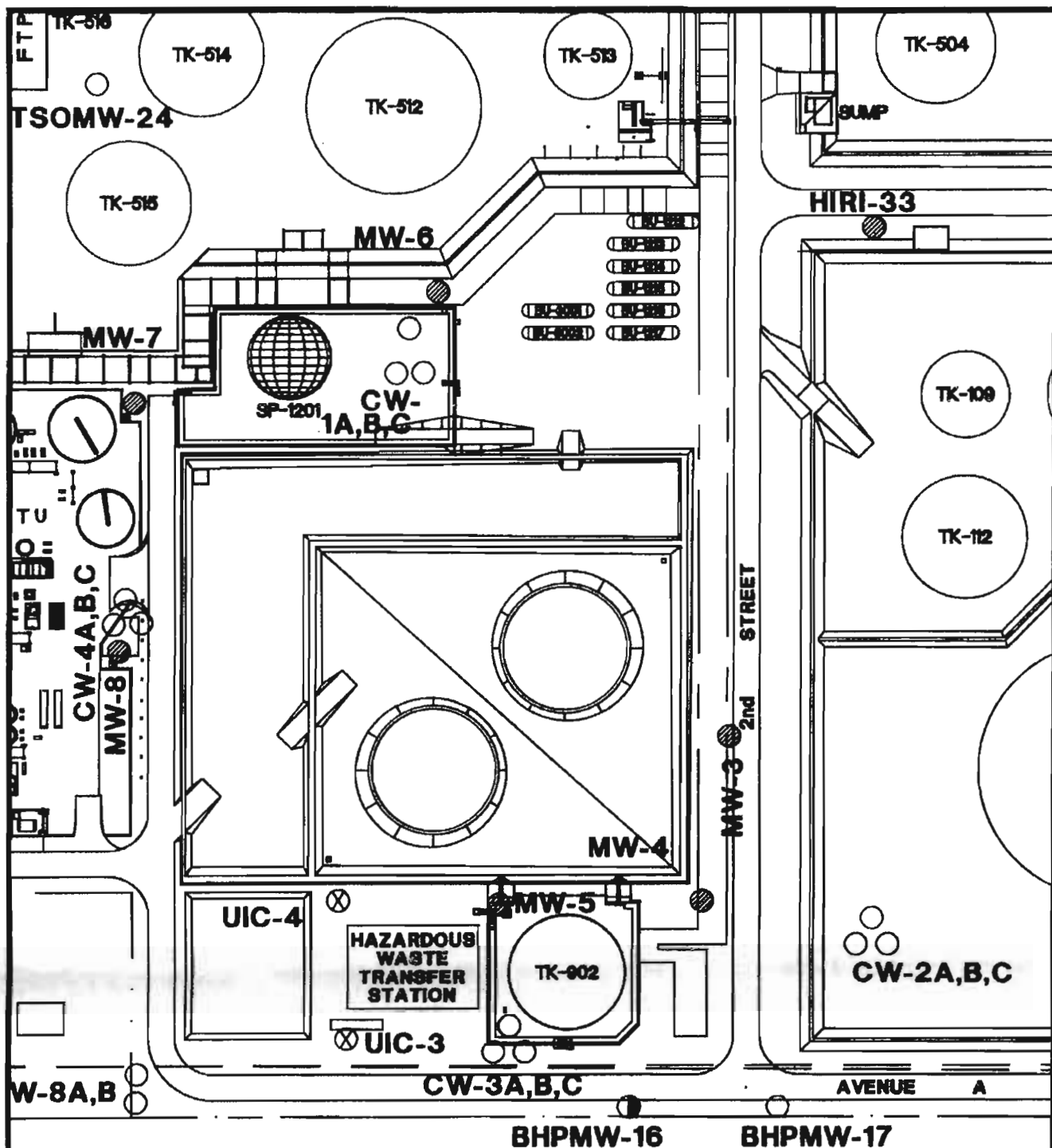
- a wells were drilled to 25 ft below grade
- b wells were drilled to 43 ft below grade
- c wells were drilled to 60 ft below grade

Table 3 - Metal Results Summary

	Barium Concentration in Groundwater (ppb)						Summary of RCRA Metals Results Above Reporting Limit (Other Than Barium) ²
	All Wells	CW-1 Wells	CW-2 Wells	CW-3 Wells	CW-4 Wells	CW1, CW-2, CW-4	
Average	53	29	27	121	31	29	
March-02	63.6	33.7	34.5	155.0	41.2	36.4	0 Additional Metals Hits
September-02	55.9	30.4	27.7	139.3	35.4	31.2	1 Additional Metals Hit
March-03	72.0	35.3	33.2	152.0	40.8	36.4	3 Additional Metals Hits: 1a, 3c, 4c
September-03	62.8	35.9	31.6	153.0	41.2	36.2	3 Additional Metals Hits: 1c, 3c, 4c
March-04	47.6	26.2	24.4	114.7	32.7	27.8	3 Additional Metals Hits: 1c, 3c, 4c
September-04	55.1	27.9	27.3	114.8	30.7	28.6	3 Additional Metals Hits: 1c, 3c, 4c
March-05	45.2	24.6	24.4	107.2	31.6	26.9	3 Additional Metals Hits: 3b, 3c, 4c
September-05	63.1	35.0	30.1	130.0	35.1	33.4	2 Additional Metals Hits: 3c and 4c
March -06 (1) ¹	51.5	26.0	23.7	126.7	38.4	29.4	33 Additional Metals Hits; 26 Metal hits above 9/05 RL
March -06 (2) ¹	47.2	26.6	24.3	116.1	31.8	27.6	28 Additional Metals Hits; equal RL as 9/05.
August-06	28.6	19.3	19.9	58.7	16.5	18.5	0 Additional Metals Hits
September-06	35.2	17.1	18.6	73.3	18.9	18.2	2 Additional Metals Hits: 3c and 4c
March-07	77.6	46.5	41.7	148.5	50.2	46.1	9 Additional Metals Hits: 1c, 3a, 3b, 3c, 4b, 4c
September-07	48.0	28.3	20.8	99.7	21.2	23.4	12 Additional Metal Hits: 1a, 2b, 3a, 3b, 3c, 4a, 4b, 4c
March-08	48.4	23.8	26.6	124.1	26.5	25.6	14 Additional Metals Hits; however, excluding 13 Hg hits due to lower RL, only CW-3C had a hit for Ni ³
September-08	51.6	29.0	26.8	125.7	24.9	26.9	15 Additional Metals Hits; only 1 Hg hit even at the low RL of 0.025 ppb. Chromium in play.
March-09	44.6	24.9	25.0	106.6	22.1	24.0	14 Additional Metals Hits; only 1 Hg hit even at the low RL of 0.025 ppb. Chromium in play.
September-09	53.6	23.6	30.6	127.2	22.5	25.6	15 Additional Metals Hits; 5 hits for Cr, 3 hits for Hg, 6 hits for Ni, and 1 hit for Vn.
March-10	55.4	30.7	33.5	130.9	26.5	30.2	7 Additional Metals Hits; 6 hits for Hg, and 1 hit for Ni.
September-10	31.8	39.0	35.0	34.3	25.7	33.2	1 Additional Metals Hit; 1 hit for Cr.
March-11	141.7	<50	<50	141.7	<50	<50	11 Additional Metals Hit; 11 hits for Se.
September-11	59.7	37.0	38.3	133.3	30.0	35.1	2 Additional Metals Hit; 2 hits for Se.

Notes:

- 1 March -06(1) and March -06(2) were analyzed from the same sample but by two different Test Americal labs.
- 2 ICP Metals, Total (SW846)
- 3 RL for Hg lowered from 1 ppb to 0.25 ppb as of 3/08 Sampling Event
Well 1 cluster north of ponds, east of Sphere 1201
Well 2 cluster east of ponds, NW of Tk101
Well 3 cluster south of ponds, SW of Tk 902
Well 4 cluster west of ponds, east of WTU



R:\RECORDS\REFINERY\A-010-B-1020.DWG

TESORO HAWAII

Q10 - REFINERY GENERAL
PLOT PLAN

FIGURE 1 - TESORO REFINERY POST-
CLOSURE MONITORING WELL MAP

DATE 11/16/09
CROSS
OPEN
APPROV

DATE
NONE

DRAWING NO.

FIGURE-1

REV.

0

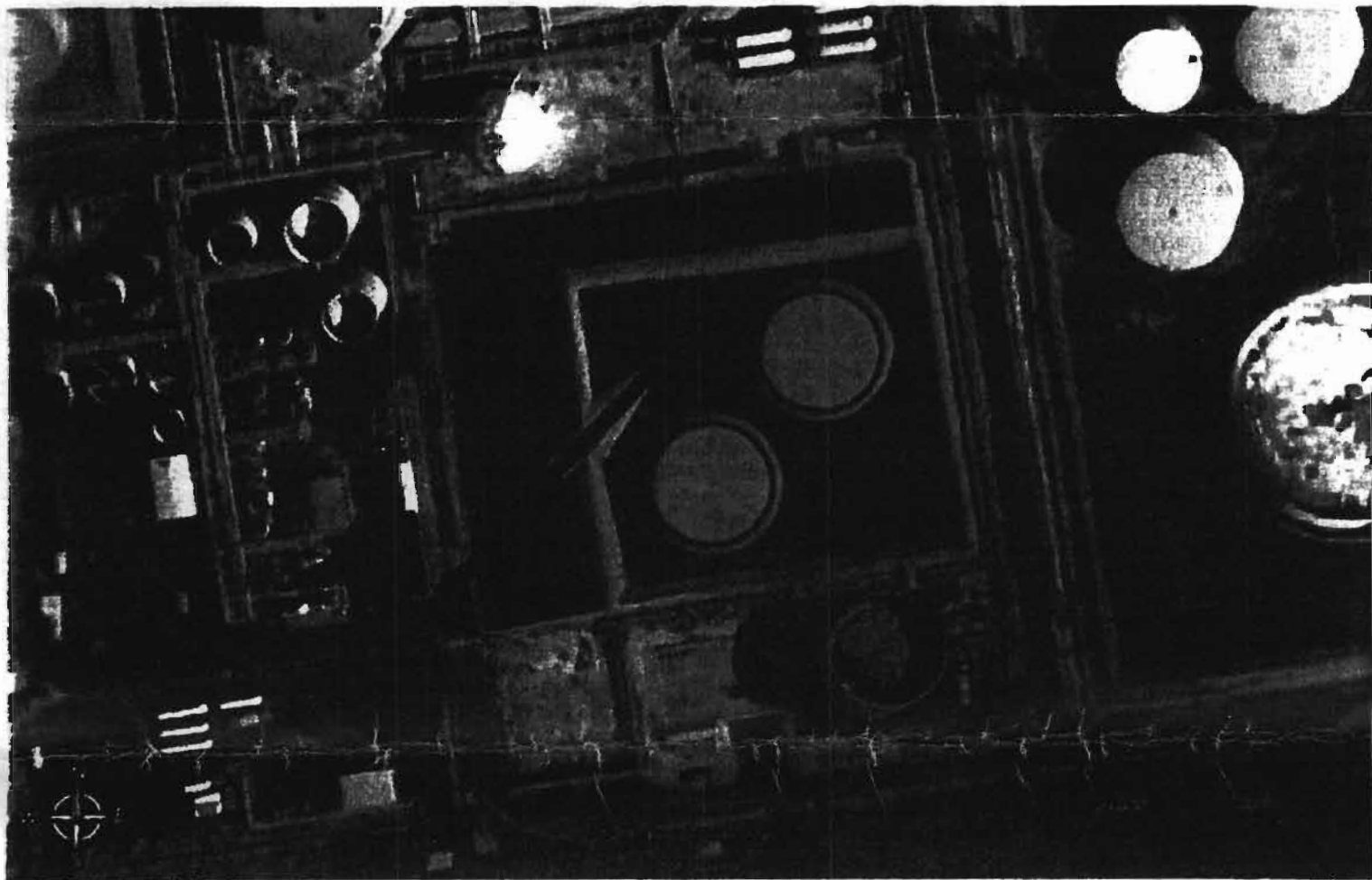


Figure 2